Session 401

Interactive Aspects of QuickTime

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QuickTime Interactivity

QT Interactivity

- Active viewing experience
- Hold the user's attention
- Outstanding for teaching
- Plays the same everywhere
- Customize the user experience
- Media integration
- Wired actions

Media Integration

- Interactive track types
  - Sprite
  - QuickTime VR
  - Macromedia Flash
- Other track types

Audio	Text	Chapter
Video	Movie	Effect
Streaming	Music	HREF

- All interoperable

Wired Actions

- QuickTime's "scripting" access
- Provide access to many properties of QT media
- Comprehensive, and growing

Wired Actions

kActionMovieSetVolume
kActionMovieSetRate
kActionMovieSetLoopingFlags
kActionMovieGoToTime
kActionMovieGoToTimeByName
kActionMovieGoToBeginning
kActionMovieGoToEnd
kActionMovieStepForward
kActionMovieStepBackward
kActionMovieSetSelection
kActionMovieSetSelectionByName
kActionMoviePlaySelection
kActionMovieSetLanguage
kActionMovieChanged
kActionMovieRestartAtTime
kActionTrackSetVolume
kActionTrackSetBalance
kActionTrackSetEnabled
kActionTrackSetMatrix
kActionTrackSetLayer
kActionTrackSetClip
kActionTrackSetCursor
kActionTrackSetGraphicsMode
kActionTrackSetIdleFrequency
kActionTrackSetBassTreble
kActionSpriteSetMatrix
kActionSpriteSetImageIndex
kActionSpriteSetVisible
kActionSpriteSetLayer
kActionSpriteSetGraphicsMode
kActionSpritePassMouseToCodec
kActionSpriteClickOnCodec

kActionSpriteTranslate
kActionSpriteScale
kActionSpriteRotate
kActionSpriteStretch
kActionQTVRSetPanAngle
kActionQTVRSetTiltAngle
kActionQTVRSetFieldOfView
kActionQTVRShowDefaultView
kActionQTVRGoToNodeID
kActionQTVREnableHotSpot
kActionQTVRShowHotSpots
kActionQTVRTranslateObject
kActionMusicPlayNote
kActionMusicSetController
kActionCase
kActionWhile
kActionGoToURL
kActionSendQTEventToSprite
kActionDebugStr
kActionPushCurrentTime
kActionPushCurrentTimeWithLabel
kActionPopAndGotoTopTime
kActionPopAndGotoLabeledTime
kActionStatusString
kActionSendQTEventToTrackObject
kActionAddChannelSubscription
kActionRemoveChannelSubscription
kActionOpenCustomActionHandler
kActionDoScript
kActionDoCompressedActions
kActionSendAppMessage
kActionLoadComponent

kActionSetFocus
kActionDontPassKeyEvent
kActionSpriteTrackSetVariable
kActionSpriteTrackNewSprite
kActionSpriteTrackDisposeSprite
kActionSpriteTrackSetVariableToString
kActionSpriteTrackConcatVariables
kActionSpriteTrackSetVariableToMovieURL
kActionSpriteTrackSetVariableToMovieBaseURL
kActionApplicationNumberAndString
kActionQD3DNamedObjectTranslateTo
kActionQD3DNamedObjectScaleTo
kActionQD3DNamedObjectRotateTo
kActionFlashTrackSetPan
kActionFlashTrackSetZoom
kActionFlashTrackSetZoomRect
kActionFlashTrackGotoFrameNumber
kActionFlashTrackGotoFrameLabel
kActionFlashTrackSetFlashVariable
kActionFlashTrackDoButtonActions
kActionMovieTrackAddChildMovie
kActionMovieTrackLoadChildMovie
kActionMovieTrackLoadChildMovieWithQTListParams
kActionTextTrackPasteText
kActionTextTrackSetTextBox
kActionTextTrackSetTextStyle
kActionTextTrackSetSelection
kActionTextTrackSetBackgroundColor
kActionTextTrackSetForegroundColor
kActionTextTrackSetFace
kActionTextTrackSetFont
kActionTextTrackSetSize

Wired Actions (Cont.)

kActionTextTrackSetAlignment
kActionTextTrackSetHilite
kActionTextTrackSetDropShadow
kActionTextTrackSetDisplayFlags
kActionTextTrackSetScroll
kActionTextTrackRelativeScroll
kActionTextTrackFindText
kActionTextTrackSetHyperTextFace
kActionTextTrackSetHyperTextColor
kActionTextTrackKeyEntry
kActionTextTrackMouseDown
kActionTextTrackSetEditable
kActionListAddElement
kActionListRemoveElements
kActionListSetElementValue
kActionListPasteFromXML
kActionListSetMatchingFromXML
kActionListSetFromURL
kActionListExchangeLists
kActionListServerQuery
kOperandExpression
kOperandConstant
kOperandSubscribedToChannel
kOperandUniqueCustomActionHandlerID
kOperandCustomActionHandlerIDIsOpen
kOperandConnectionSpeed
kOperandGMTDay
kOperandGMTMonth
kOperandGMTYear
kOperandGMTHours
kOperandGMTMinutes
kOperandGMTSeconds
kOperandLocalDay
kOperandLocalMonth
kOperandLocalYear
kOperandLocalHours
kOperandLocalMinutes
kOperandLocalSeconds
kOperandRegisteredForQuickTimePro
kOperandPlatformRunningOn
kOperandQuickTimeVersion
kOperandComponentVersion
kOperandOriginalHandlerRefcon
kOperandTicks
kOperandMaxLoadedTimeInMovie
kOperandEventParameter
kOperandFreeMemory
kOperandNetworkStatus
kOperandQuickTimeVersionRegistered
kOperandSystemVersion
kOperandMovieVolume
kOperandMovieRate
kOperandMovieIsLooping
kOperandMovieLoopIsPalindrome
kOperandMovieTime
kOperandMovieDuration
kOperandMovieTimeScale
kOperandMovieWidth
kOperandMovieHeight
kOperandMovieLoadState
kOperandMovieTrackCount
kOperandMovieIsActive
kOperandMovieName
kOperandMovieID
kOperandTrackVolume
kOperandTrackBalance
kOperandTrackEnabled
kOperandTrackLayer
kOperandTrackWidth
kOperandTrackHeight
kOperandTrackDuration
kOperandTrackName
kOperandTrackID
kOperandTrackIdleFrequency
kOperandTrackBass
kOperandTrackTreble
kOperandSpriteBoundsLeft
kOperandSpriteBoundsTop
kOperandSpriteBoundsRight
kOperandSpriteBoundsBottom
kOperandSpriteImageIndex
kOperandSpriteVisible
kOperandSpriteLayer
kOperandSpriteTrackVariable
kOperandSpriteTrackNumSprites
kOperandSpriteTrackNumImages
kOperandSpriteID
kOperandSpriteIndex
kOperandSpriteFirstCornerX
kOperandSpriteFirstCornerY
kOperandSpriteSecondCornerX
kOperandSpriteSecondCornerY
kOperandSpriteThirdCornerX

Wired Actions (Cont.)

kOperandSpriteThirdCornerY
kOperandSpriteFourthCornerX
kOperandSpriteFourthCornerY
kOperandSpriteImageRegistrationPointX
kOperandSpriteImageRegistrationPointY
kOperandSpriteTrackSpriteIDAtPoint
kOperandSpriteName
kOperandQTVRPanAngle
kOperandQTVRTiltAngle
kOperandQTVRFieldOfView
kOperandQTVRNodeID
kOperandQTVRHotSpotsVisible
kOperandQTVRViewCenterH
kOperandQTVRViewCenterV

kOperandMouseLocalHLoc
kOperandMouseLocalVLoc
kOperandKeyIsDown
kOperandRandom
kOperandCanHaveFocus
kOperandHasFocus
kOperandTextTrackEditable
kOperandTextTrackCopyText
kOperandTextTrackStartSelection
kOperandTextTrackEndSelection
kOperandTextTrackTextBoxLeft
kOperandTextTrackTextBoxTop
kOperandTextTrackTextBoxRight
kOperandTextTrackTextBoxBottom
kOperandTextTrackTextLength
kOperandListCountElements
kOperandListGetElementPathByIndex

kOperandListGetElementValue
kOperandListCopyToXML
kOperandSin
kOperandCos
kOperandTan
kOperandATan
kOperandATan2
kOperandDegreesToRadians
kOperandRadiansToDegrees
kOperandSquareRoot
kOperandExponent
kOperandLog
kOperandFlashTrackVariable
kOperandStringLength
kOperandStringCompare
kOperandStringSubString
kOperandStringConcat

Documentation available at:

http://developer.apple.com/techpubs/quicktime/qtdevdocs/

New QuickTime 5 Interactivity

New Features in QuickTime 5

- Cubic VR
- Media Skins
- Macromedia Flash 4
- New Wired Actions
- Server Communication

Cubic VR

- Top and bottom or high field of view
- Works just like a cylinder
- Doesn't replace cylinders
  - Under °115, use cylinders
- Backwards compatible
- Authoring
  - Apple: MakeCubic
  - 3rd party
  - Sample code: VRMakePano

Demo

Cubic VR

3rd-Party Authoring

Stitcher File Edit View Stitch Render Window Help Fri 6:24 PM

Toolbar

Image Str

DSCN9766.JPG DSCN9767.JPG DSCN9768.JPG DSCN9769.JPG DSCN9770.JPG

REALVIZ

STITCHER®

MacOSX
MacOS9.1fr
MacOS9.2us
Applications
Datas
Install
Getting S... Stitcher
HTML He...Stitcher
Stitcher for Mac

Creating Cubic QuickTime VR Movies

Ken Turkowski
Principal Scientist, Immersive Media

Overview

- VRMakePano Sample Code
  - Makes cylindrical and cubic QTVR movies
    - From GWorlds, picture files, or movie files
- MakeCubic Utility Application
  - Makes cubic QTVR movies…
    - From cube faces
    - From an equirectangular spherical pict

VRMakePano Sample Code

- Make cylindrical or cubic QTVR movies
- Library-quality code
- Designed to be usable as-is
  - Drop into your project
  - Link
  - Run

VRMakePano Sample Code

- Common Interface

```
OSErr VRMovieToQTVRCubicPano(
    VRMakeQTVRParams *qtvrParams,
    FSSpec*srcTileSpec,
    FSSpec*srcHSTileSpec,
    FSSpec*srcFSTileSpec,
    FSSpec*dstMovieSpec
);
```

$$VR\begin{Bmatrix} Movie \\ Pict \\ GWorld \end{Bmatrix} ToQTVR\begin{Bmatrix} Cyl \\ Cubic \end{Bmatrix} Pano\begin{Bmatrix} 2v0 \\ 2h0 \\ \\ \end{Bmatrix}$$

MakeCubic Utility Application

- Uses VRMakePano sample code
- Value added beyond VRMakePano:
  - Conversion from equirectangular spherical picts
  - Optimal minimum and default FOV
  - Preview resolution independent of pano resolution
- VRMakePano functions not available in MakeCubic:
  - No URL hotspots; only undefined (“blob”) hotspots
  - No cylindrical panoramas

Demo

MakeCubic

Media Skins

- Arbitrary Shaped Movie
- Skin the Media, not the Player
- Branding
- Use Full QT Interactive Toolset

Demo

Media Skins

Media Skins: Authoring

- Parts:
  - Source Movie—any QT media
  - Window Mask —1 bit
  - Drag Region Mask —1 bit
- XML Importer

- Sample Code available

New Wired Actions

- Text Tracks
  - User Input
  - Manipulating Text via Actions
- App Messages (QT Player)
  - Enter/Exit Full Screen
  - Close Window
- Network Status, MovieLoadState
- VR
- Math
- Misc.

Macromedia Flash Support

- Combine Macromedia Flash and Video
- MP3 Audio
- Text Input
- Load Movie/Load Variable
- Multiple Flash Tracks
- New Wired Actions

Demo

Macromedia Flash

Server Communication

- QT Lists
  - Hierarchical Data Structures
  - One QT List per Movie or Track
- XML as Exchange Format
  - *"qtlist"* added as root element
- Manipulate via Wired Actions

Demo

QT Lists

Integration

- Put it all together
- Complex movies which hold the user's attention
- Self-contained interactive experiences

Demo

Integration

Roadmap

FF109 Feedback Forum for QT

Room J1
Thurs., 3:30pm

ANNOUNCING

QuickTime Live!

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